Diploma Work Proposal

Synergistic Hybrid Inorganic-Biological Colloidal Particles for Emerging Sensing Applications

Background

Hybrid inorganic-biological materials with combined physiochemical and biological properties have attracted much attention for emerging applications including medical, diagnostics, catalysis, biofuel cells and nano-devices. Inorganic nanomaterials impart unique optical, electrochemical and magnetic characteristic; while biological materials provides specific bio-recognition capability, and offer excellent biocompatibility [1,2]. Integration of various inorganic and biological materials into a one entity allows intimate contact and enhances the synergistic interactions between the hybrid materials.

Project Description

In this project, you are going to fabricate various colloidal composite materials enables precise manipulation of physiochemical properties and biological functions; characterize the optical, electrochemical and plasmonic properties as well as biological functions of the composite materials; investigate their applications for therapeutics and diagnostics; and perform literature review on hybrid colloidal materials. The student can gain hand-on experience on colloidal chemistry, design and fabrication of various colloidal materials; conjugation and integration of biomolecules with nanomaterials; and characterization techniques for biomaterials and nanomaterials.

Project Duration

20 weeks (30 points)

Dr. Wing Cheung Mak

Email: *mamak@ifm.liu.se*

Phone: 013 28 69 21

1) Aime C, et al., Journal of Polymer Science Part B-Polymer Physics 50(10), 669-680, 2012.

2) Agrawal M, et al., Journal of Materials Chemistry 21(3), 615-627, 2011.